

REMARKS

By the foregoing Amendment, Claim 2 is amended. Entry of the Amendment, and favorable consideration thereof, is earnestly requested. Claim 7 having been previously cancelled, Claims 1-6 and 8-32 are currently pending.

Claim 2 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 2 has been amended in a manner which Applicant believes obviates these rejections.

Claim 1 reads as follows:

1. Gum base granules comprising at least one biodegradable gum base polymer, wherein the gum base has a water content of less than 5.0% by weight of the gum base.

**Issues Set Forth By the Examiner
Directed Toward Applicant's Previous Response**

Pre-Degradation

The Examiner rejects the argument from the Applicant concerning a likely degradability of granules with a large surface/volume ratio for a long time by stating:

If applicant's statement were true, the degradable polymers used in a chewing gum composition would pre-degrade if the chewing gum was kept for a long time, for example, in a package on the shelf in a store.

With this statement, the Examiner actually *supports* Applicant's argument.

Degradable polymers are named "degradable" since they can be degraded, e.g. through contact with moisture from the surrounding air. Hence indeed care must be taken and such polymers should be handled differently than regular chewing gum polymers. Consequently, degradable polymers in a chewing kept for a long time in a package on the shelf in a store ***may actually*** start to degrade unless precautions are taken. A lot of research has been put into handling these satisfactorily; however at present still no product has been sent to the market, i.e. due to the fact that pre-degradation can still not be sufficiently avoided.

Consequently, with this knowledge in mind, the skilled person would indeed refrain from using degradable polymers in connection with the invention of Gmunder et al. in that it is likely that degradable polymers may start to pre-degrade if kept as granules with large surface/volume ratio for a long time, which will be the case during transportation as in Gmunder et al. Surely, with large surface/volume ratio, the granules would be more exposed to moisture in the air.

This is precisely why Applicant contends that one skilled in the art would not have used the degradable polymers taught by Bunczek et al. and/or Wittorff et al. with the granules of Gmunder et al. It was not until Applicant, through extensive research, developed the present invention that that anyone skilled in the art would

have considered it possible to use degradable polymers in conjunction with granules. Therefore, the combinations suggested by the Examiner would not have been obvious to one skilled in the art, as one skilled in the art would have dismissed the use of degradable polymers in conjunction with granules due to the large surface/volume ratio of granules and the exacerbation caused thereby of the very pre-degradation issues recognized by the Examiner herself.

Moisture Content

The Examiner acknowledges that the examples of Gmunder et al. disclose gum bases comprising softeners in amounts between 4% and 47%. And furthermore the Examiner repeats the information, given from the Applicant in its last Response, that some softeners used in chewing gum comprise maybe 25% by weight of water. Thus, the skilled person would from Gmunder et al. take the knowledge about a particulated gum base with an amount of water between 1% and 12% by weight.

Based on the sentences from Gmunder et al. set forth by both the Examiner and the Applicant, it seems clear that some gum bases of Gmunder et al. will have water content above 5% (i.e., 5% to 12%) and some gum bases will have water content below 5% (i.e., 1% to 5%). However, Gmunder et al. teaches absolutely nothing which would lead one skilled in the art to believe that some are more

preferred than others. In Gmunder et al., C6/L27-34 is stated that for all the shown embodiments, i.e. softener amount between 4 and 47%:

Liquid ingredients are not present in the preferred particulated gum base of the present invention **to a functional degree**. By functional degree it is meant that the level of liquid ingredients present in the particulated gum base will not appreciatively cause the pulverized ingredients or the final inventive gum base from re-agglomerating or have reduced free-flowing particulate dry form. By free-flowing it is meant that the particulated gum base may be poured from a container at a relatively even flow rate, as opposed to coming out of the container in large clumps.

Hence, it is clear that all disclosed embodiments and examples are equally well-suited for the purposes specified in Gmunder et al., namely to obtain free-flowing particles. Thus no incentive whatsoever is given to employ a moisture content lower than 5% as opposed to a moisture content higher than 5%.

In this regard, it must be recognized that even if the Examiner has established a *prima facie* case of obviousness (which Applicant believes is not the case for the reasons set forth herein) Applicant can rebut such a *prima facie* case of obviousness based on overlapping ranges (here, there may be overlap in the range of 1% to 5%) by showing the criticality of the claimed range (here, less than 5%). ("The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative

to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); "Thus, it is well-recognized that Applicant can rebut a presumption of obviousness based on a claimed invention that falls within a prior art range by showing '(1) [t]hat the prior art taught away from the claimed invention...or (2) that there are new and unexpected results relative to the prior art.' MPEP 2144.05(III), quoting *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004).

That is precisely the case here, wherein Applicant has, through extensive research, discovered that degradable polymers can, contrary to the conventional wisdom, be used in conjunction with granules, even with their inherent large surface/volume ratio, if the water content is kept below 5% by weight of the gum base. There is absolutely nothing in the prior art that hints at this realization, which is indeed new and unexpected.

**Non-obviousness of Gmunder et al. in
View of Bunczek et al. and/or Wittorff et al.**

It is noted that the Examiner with reference to *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992) states that the term "chewing gum" can be used as a common field of applicant's endeavor and hence a combination between the

field of compressed chewing gum and the field of biodegradable chewing gum is sought justified.

The arguments in Applicant's last Response regarding the huge difference between these two fields still stand; however, even if the documents in question are combined, Applicant respectfully states that this will not lead to the present invention, which is supported by Applicant's arguments here below.

Wittorff et al. and Bunczek et al. teach gum bases including polyester. As stated by the Examiner, indication is given on neither granules nor low water content. From both Wittorff et al. and Bunczek et al. is only taken the knowledge of substituting a conventional polymer with a degradable polymers, hence Applicant will focus its argumentation on Bunczek et al.

Regarding Bunczek et al. it is worth noticing some passages from the document, starting with C1, L46-52:

The present invention provides improved chewing gum formulations and bases, as well as methods of producing chewing gum and bases. Pursuant to the present invention chewing gum and gum bases that include edible polyesters are provided. In this regard, traditionally used elastomers and elastomer plasticizers **can be replaced** with edible polyesters.

This sounds very easy. Specifically, it would seem that the edible polyesters of Bunczek et al. apparently can substitute any elastomer or resin in other products. However, the reality is disclosed later in the same document, namely at C7, L59-64:

The polyesters made here **were not readily compatible with other base ingredients** such as elastomers, elastomer plasticizers, waxes, and fats. By using a 2-monoglyceride as the starting diol instead of glycerin or propylene glycol, **it is believed** that more compatible polyesters can be developed and used with other gum base ingredients.

In other words, the inventors of Bunczek et al. have apparently not found out what it takes to successfully add an edible polyester into chewing gum; only have they had the idea that a polyester could be added.

Consequently, it is respectfully submitted that a skilled person starting from Gmunder et al. would not feel incentive to use the knowledge of Bunczek et al.

Gmunder et al. teaches particulated chewing gum bases. The purpose of the particulated chewing gum base of Gmunder et al. is to make transportation of chewing gum base easier, and conventional chewing gum can then be manufactured by standard melting and/or mixing methods when the particulated chewing gum base has reached its target. This is indeed in contrast to the present application, where the granules are used to make compressed chewing gum.

Water content is indirectly mentioned as stated in the arguments presented above but without any indication of advantages related to certain water levels.

Thus, first of all Bunczek et al. and Gmunder et al. have nothing in common besides belonging to the field of chewing gum, i.e. U.S. Class 426/3. A quick search in this class discloses 659 granted US patents and 210 published U.S. applications, i.e. Bunczek et al. and Gmunder et al. are selected among a very large number of possible documents.

Second of all, even by looking through this large number of documents, no document has been found indicating any advantages related to low water content.

Third of all, once Bunczek et al. and Gmunder et al. have been selected, it is not evident what would be the outcome of such combination.

A most likely combination of Bunczek et al. and Gmunder et al. could be: The skilled person would from Gmunder et al. take the knowledge about a particulated gum base comprising between 4 and 47% of softener, i.e. with an amount of water between 1 and 12% by weight. Looking into Bunczek et al. he/she would expect the polyester to be non-compatible with the other gum base ingredients, which would most likely make him/her refrain from using them.

Moreover he/she would have the above-mentioned knowledge about risk of pre-chew degradation of degradable polymers, in particular in granules with large surface/volume ratio. However, if he/she really insists on combining Gmunder et al. and Bunczek et al., he/she would from Bunczek et al. take polyesters to replace at least some of the polymers of Gmunder et al.

A resulting product is a particulated gum base, where the content of polyesters is not compatible with the other gum base ingredients, and where moreover a water content may be any random value as the skilled person has had no indication from any passages in neither Bunczek et al. nor Gmunder et al. whether a low amount is better than a high amount of water.

Indication is given in neither Bunczek et al. nor Gmunder et al. about compression of granules, and hence the skilled person would have no idea of whether the manufactured particulated gum base could be used in compressed chewing gum, where the mechanical interaction is very different from standard techniques.

According to the present invention, i.e. the following important issues have been discovered:

- (A) By keeping water content low, compatibility may be obtained between degradable polymers and other gum base ingredients.
- (B) In spite of their very different nature from conventional polymers, degradable polymers may be used in compression techniques with success. This is in particular the case when the water content is kept low.

In the cited prior art, no indication is given regarding water content or compression techniques. Moreover, as cited above, passages in Bunczek et al. will lead the skilled person starting from Gmunder et al. away from combinations with Bunczek et al.

Even though Wittorff et al. does not disclose a paragraph indicating non-compatibility, the remaining arguments for Bunczek et al. apply as well for Wittorff et al. Namely that indication is given in Wittorff et al. on neither water content nor compression techniques.

Consequently, it is respectfully submitted that the skilled person would not reach the present invention of Claim 1 and therefore Claim 1 is considered to be non-obvious.

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For the foregoing reasons, Applicant respectfully submits that all pending claims, namely Claims 1-6 and 8-32, are patentable over the references of record, and earnestly solicits allowance of the same.

Respectfully submitted,

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